

WETLANDS ASSESSMENT REPORT

NORTHERN REGIONAL LIBRARY FACILITY, PHASE IV
UNIVERSITY OF CALIFORNIA, BERKELEY (RICHMOND BAY CAMPUS)
RICHMOND FIELD STATION
RICHMOND, CA



April 13, 2018

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1.0 INTRODUCTION

The Northern Regional Library Facility (NRLF) is located on the University of California, Berkeley Richmond Bay Campus (RBC), now referred to as UC Berkeley's Richmond Field Station. For the purposes of this study we refer to the site with its current name Richmond Field Station (RFS). The NRLF is a complex of buildings that store millions of low-use library materials. In order to meet increased storage demand, a new climate controlled building has been planned as an approximately 26,600 gross square-foot addition to the existing NRLF buildings. This proposed new Phase IV addition will store an additional 3.1 million volumes.

The existing NRLF and the proposed Phase IV development, which is currently in the 100 percent Schematic Design (SD) phase, is situated immediately adjacent to an important occurrence of remnant coastal terrace prairie known as Big Meadow. The topography at Big Meadow is gently undulating and during typical rain years ponded water has been observed within some of the topographical depressions. Although no prior sampling has been performed of the three parameters that are used by the U.S. Army Corps of Engineers (USACE) to define wetlands (vegetation, soils, hydrology), the presence of wetlands within Big Meadow has been suspected. Therefore, potential wetland areas have been shown on the Detailed Project Program (DPP) for the NRLF Phase IV (EHDD, 2017) and an assessment of the project site for potentially jurisdictional waters is required by mitigation measure LRDP MM BIO 6a of the EIR (Tetra Tech, 2014).

1.1 Purpose of Wetlands Assessment

The wetlands assessment was performed to determine if any potentially USACE jurisdictional waters occur within or proximal to the proposed Phase IV development area. The assessment was performed in order to comply with mitigation measure LRDP BIO 6a, which reads as follows:

BIO-6a: 2014 LRDP development projects shall avoid, to the extent feasible, the filling of or discharge to potentially jurisdictional waters. Therefore, during the design phase of any future development project that may affect potentially jurisdictional waters, a preliminary evaluation of the project site shall be made by a qualified biologist to determine if the site is proximate to potentially jurisdictional waters and, if deemed necessary by the biologist, a wetlands delineation shall be prepared and submitted to the USACE for verification.

Because the USACE's preferred mitigation for impacts to jurisdictional waters is avoidance, to the extent practicable, 2014 LRDP development shall be located to avoid the filling of or discharging to jurisdictional waters.

If wetlands or other waters of the U.S. are found and a delineation report is prepared and submitted to the USACE for a jurisdictional determination, mitigation measure BIO-6b describes the permit application process and compensatory mitigation for losses to jurisdictional waters.

1. Note that previous studies and the 2014 Long Range Development Plan (LRDP) and Environmental Impact Report (EIR), which are still applicable to the site, use the name Richmond Bay Campus.

1.2 Site Location and Wetlands Study Area

The NRLF at the RFS is located immediately south of Regatta Boulevard in the city of Richmond, Contra Costa County, California (**Map 1**). The site is bordered on the west and southwest sides by Big Meadow, while towards the south and east lies additional open space areas and assorted buildings associated with the RFS. Tidal marsh and the edge of San Francisco Bay is located approximately 0.4 miles towards the south. The site lies within the U.S. Geological Survey (USGS) 7.5-minute Richmond quadrangle and Land Resource Region C, Mediterranean California, of the Arid West (USACE, 2008).

The wetlands assessment evaluated the area within the footprint of the proposed NRLF Phase IV development as well as an additional 130-foot-wide distance along the west and southern sides of the proposed development. This area is shown on **Map 2** and referred to as the “wetlands study area”. In the interest of avoiding impacts to the coastal terrace prairie and also potential wetland areas within Big Meadow, the proposed Phase IV building and its associated features, such as utilities, roads, and stormwater collection basins, have been located by the design in areas with the least likelihood for occurrences of sensitive resources.

1.3 Definition of Wetlands

The USACE regulates discharge of dredged or fill material into waters of the U.S. under Section 404 of the Clean Water Act (CWA), and issues permits for work and the placement of structures in navigable waters of the U.S. under Sections 9 and 10 of the Rivers and Harbors Act of 1899. USACE defines wetlands pursuant to Section 404 of the CWA as follows:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

In defining the presence and extent of a wetland potentially under its jurisdiction, USACE requires that positive evidence of all three of the following parameters be established: dominance of hydrophytic vegetation, presence of hydric soils, and indications of wetland hydrology. If one or more of these elements is missing under normal circumstances, then the area is not a wetland subject to USACE jurisdiction (Environmental Laboratory, 1987).

2.0 ENVIRONMENTAL SETTING

2.1 Topography

The wetlands study area lies between approximately 18 and 21 feet above mean sea level and is characterized by gently undulating topography. As a whole, Big Meadow gently slopes in a southwesterly direction at around a 1 to 2 percent slope.

2.2 Soils

Soils within the wetlands study area and Big Meadow consist of Clear Lake clay (**Map 3**). Clear Lake clay is derived from clayey alluvium associated with metamorphic and sedimentary parent material, forms 0 to 15 percent slopes, is poorly drained, and experiences frequent ponding. The shallow soil profile consists of clay from 0 to 60 inches deep (NRCS, 2018). During this wetland assessment, soil pits were dug at each sampling location to a depth of 20 inches below ground surface in order to evaluate for hydric soil properties. In general, soils observed in the

sampling pits consisted of clay loam from the surface to a depth of 10 to 13 inches underlain by clay to the bottom of the 20-inch deep pit.

2.3 Hydrology

Site inspections and a review of topographic maps and the National Wetland Inventory (NWI) reveal that there are no streams or perennial surface water features within the wetlands study area (**Map 4**). The nearest water feature is a trapezoidal drainage ditch immediately west of the property boundary that is shown on the NWI and classified as “riparian”. This is a man-made feature that conveys stormwater runoff and ultimately discharges to Meeker Slough. The nearest stream that is depicted on the USGS 7.5-minute Richmond quadrangle and the NWI is an unnamed stream approximately 0.3 miles southwest of the NRLF buildings. This stream flows in an approximately southeasterly direction and empties into Meeker Slough and the Richmond Inner Harbor.

The rooftop stormwater runoff from the NRLF buildings is routed into storm drains. Runoff from other landscape areas and impervious surfaces around the NRLF tends to runoff into Big Meadow, where it occasionally collects in topographic depressions. Due to the fine-grained soils that are found within Big Meadow, certain areas of ponded water have been observed by U.C. Berkeley staff to remain for extended periods of time that range anywhere from several days to several months. Due to the generally southwesterly slope of Big Meadow, surface runoff tends to flow in a southerly to southwesterly direction. As a result, the southwestern areas of Big Meadow beyond the limits of the wetland study area tend to collect more runoff and experience ponding for a greater length of time than the northern areas (Karl Hans, personal communication, April 3, 2018).

Several groundwater monitoring wells are located in the vicinity of the NRLF and are used for monitoring groundwater elevations and contaminant levels from historical industrial uses at the property. Groundwater elevations in the wells that are nearest to the wetland study area range appear to fluctuate approximately two feet between the wet and dry seasons. Minimum depth-to-groundwater in these monitoring wells has ranged from 7.41 feet below top-of-casing (TOC) to 11.11 TOC between 2010 and 2017 (Tetra Tech, 2017)

2.4 Vegetation

Big Meadow is a remnant occurrence of coastal terrace prairie. Previous botanical studies performed at Big Meadow by Wildlife Research Associates (2014), URS (2007), and Rana Creek (2017) identified the vegetation alliances within Big Meadow as primarily California oatgrass prairie or purple needlegrass grassland. California oatgrass was observed to be the dominant native perennial grass and often co-occurs with purple needlegrass, the second most common native perennial grass. Other relatively common native species at Big Meadow include meadow barley (*Hordeum brachyantherum*), toad rush (*Juncus bufonius* var. *bufonius*), western rush (*Juncus occidentalis*) and blue eyed grass (*Sisyrinchium bellum*). Scattered occurrences of purple owl's clover (*Castilleja exserta* ssp. *exserta*), narrow mule's ear (*Wyethia angustifolia*), hairy gumplant (*Grindelia hirsutula* var. *hirsutula*), and brown-headed rush (*Juncus phaeocephalus* var. *phaeocephalus*) also occur in the meadow.

Disturbed areas in the northern section of the meadow and adjacent to the NRLF buildings are dominated by Harding grass (*Phalaris aquatica*). Other very common non-native species include bristly ox-tongue (*Helminthotheca echioides*), rat tail fescue (*Festuca myuros*), slender wild oat (*Avena barbata*), and Italian ryegrass (*Festuca perennis*). These non-native species also occur in the higher quality prairie areas, but generally at a lesser coverage.

3.0 METHODS

3.1 Survey Date and Site Conditions

The wetlands assessment was performed on April 3, 2018 by John Wandke of Rana Creek. Conditions on the day of the survey were sunny with a light to moderate onshore breeze and temperatures in the mid 60's F. The survey was performed during the spring in order to allow identification of as many plant species as possible during their flowering stage and to promote reliable identification of wetland hydrology indicators. The survey was performed ten days after the most recent rainfall event, which ended on March 24, 2018. March 2018 was a relatively rainy month, with a total of 4.99 inches of precipitation occurring at the Richmond City Hall (RHL) weather station, although total rainfall amounts for the year were below average.

The RFS staff typically mows portions of Big Meadow during the month of May for control of Harding grass and thatch reduction. At the time of the wetland assessment, none of the study area had been subjected to mowing. A grass fire had occurred during September 2017 and greatly reduced the coverage of Harding grass. However, herbaceous vegetation had recovered by the time of the April 2018 wetland assessment. There were very few areas of bare ground that appeared to be related to the fire.

3.2 Visual Assessment

The Phase IV development footprint and an additional area of approximately 130 feet in a westerly and southerly direction were traversed on foot in order to identify areas with potential wetland characteristics. During the visual assessment, we searched for topographic depressions, swales, occurrences of hydrophytic plant species (obligate, facultative wetland, facultative), and evidence of ponded water and/or moist soils or a lack of these features. We chose locations for sampling of vegetation, soils, and hydrologic indicators by USACE methods where one or more these features were encountered and/or where U.C. Berkeley staff had observed ponded water during and after periods of wet weather. In the absence of visual plant or hydrologic indicators, we placed sample locations in the bottom of the lowest topographic depressions we could find.

3.3 Sampling for Wetland Vegetation, Soils, Hydrologic Indicators

Sampling for vegetation, soil, and hydrologic indicators was performed in accordance with the guidelines provided in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual, Arid West Region (USACE, 2008) (Regional Supplement). A total of five sample points were assessed for hydrophytic vegetation, presence of hydric soil, and hydrologic indicators (**Map 2**). Points A-01, A-02, A-03, and A-04 were located within or immediately adjacent to the Phase IV development footprint and its 25-foot buffer zone. These sample points were located in topographic depressions and were sited to determine if any wetlands are present within or immediately adjacent to the construction area and/or the 25-foot buffer zone.

Sample point A-05 was located in a feature discovered during the visual assessment that appeared to be the most likely wetland within the study area. This feature is located approximately 85 feet west of the 25-foot buffer and 110 feet west of the Phase IV building footprint. We mapped the perimeter of the feature based on vegetation, topography, and hydrologic indicators of wetlands using a Trimble GeoXH differential GPS unit.

3.3.1 Vegetation Sampling

Vegetation sampling was performed at each sampling point in order to determine dominance of hydrophytic plant species. At each sampling point, a five-foot radius circular plot was established for estimating absolute vegetation cover within the herbaceous layer. Only an herbaceous layer is present within the study area, since the site is a coastal terrace prairie. We estimated absolute percent cover by species within four 0.25-meter square quadrats within the circular plot. Quadrats were placed at each of the four cardinal directions within the circular plot. The results from the four quadrats were averaged in order to arrive at a mean absolute cover value by species to be used in the dominance test.

As described in the Regional Supplement, we used the 50/20 rule to establish dominant species and applied the dominance test (>50% of dominant species are obligate, facultative wetland, or facultative). The prevalence index test is used if vegetation fails the dominance test and hydric soils and hydrologic indicators are present. There were no instances where such conditions occurred, but we used the prevalence index on sample A-01 as a check because the dominance test returned a result of 50 percent. If the vegetation data does not pass one of these tests, the area sampled does not qualify as being dominated by hydrophytic vegetation. We used the USACE State of California Wetland Plant List (USACE, 2016) to determine the wetland indicator status of each species (**Table 1**).

Table 1 - Wetland Vegetation Indicator Classes

UPL	Upland	Occurs in wetlands in another region, but almost always occurs in uplands in the region specified
FACU	Facultative Upland	Usually occurs in nonwetlands (estimated probability 67-99%), but occasionally found in wetlands (estimated probability 1-33%)
FAC	Facultative	Equally likely to occur in wetlands or nonwetlands (estimated probability 34-66%)
FACW	Facultative Wetland	Usually occur in wetlands (estimated probability 67-99%), but occasionally found in nonwetlands
OBL	Obligate Wetland	Occur almost always (estimated probability >99%) in wetlands under normal conditions

3.3.2 Soil Sampling

Hydric soils are indicative of wetlands and can be identified by properties that result from prolonged saturated and anaerobic conditions. These properties are typically associated with biogeochemical processes that include accumulation of organic matter, and the reduction, translocation, or accumulation of iron, manganese, and/or sulfate (USDA, 2017).

In order to evaluate the sampling locations for hydric soils, we followed the soil sampling guidance described in the Regional Supplement. At the center of each plot, a 20-inch deep soil pit was excavated by hand using a shovel. The texture of the soil was determined and the soil profile was examined for hydric soil indicators as described in the Regional Supplement and Field Indicators of Hydric Soils of the United States (USDA, 2017). The soil was evaluated in a damp condition immediately after excavation and any changes in texture, color, or mottling were described as distinct layers. The thickness of each layer was measured with a tape measure.

Colors of soil matrix and/or mottles were evaluated using a Munsell color chart and using freshly exposed soil samples viewed in natural outdoor light.

3.3.3 Hydrologic Indicators

At each sample location and in the surrounding area, a search for primary and secondary hydrologic indicators was performed. There are 23 wetland hydrology indicators listed in the Regional Supplement and most are associated with features created by the presence of saturation or inundation during the growing season, as defined by the Regional Supplement. In addition, each soil pit was evaluated for the presence of saturated soil and/or the presence of a shallow water table.

4.0 FINDINGS

Sampling activities did not find any wetlands that meet the USACE criteria of hydrophytic vegetation dominance, hydric soils, and wetland hydrology indicators within the Phase IV building footprint, the 25-foot buffer zone, or the immediately adjoining area. With the exception of sample point A-05, the visual inspection did not locate any other areas within the wetlands study area that contained potential wetland characteristics that warranted sampling.

Although the locations sampled at A-01 through A-04 are situated within topographic depressions, had some facultative or facultative wetland plant species present, and have been observed by U.C. Berkeley staff to periodically contain ponded water, the inundation/saturation is not of sufficient frequency or duration to create hydric soils or to cause dominance of hydrophytic vegetation. Sample point A-05 did contain confirm positive indicators of dominant hydrophytic vegetation, hydric soils, and three hydrology indicators. This sample point is located within a small depression 85 feet west of the development area buffer zone and is approximately 1,463 square feet in size (**Map 2**). **Table 2** provides a summary of the sampling points and results.

Only sample point A-05 had dominant hydrophytic vegetation, which was meadow barley (*Hordeum brachyantherum*), a facultative wetland species. As shown in **Table 2**, sample points A-01 and A-02 located south of the NRLF did have higher dominance of hydrophytes than sample points A-03 and A-04, but not greater than the 50 percent required to pass the dominance test. The coastal terrace prairie does have many species that are facultative or facultative wetland, but with the exception of sample point A-05, they were not dominant. Most dominant species were facultative upland at sample point A-01 through A-04. No obligate wetland species were observed at any of the sample locations.

Soils at sample points A-01 through A-05 were clay loam and clay and were moist to damp. No high water table or soil saturation was observed in any of the soil pits. Soil color at these locations does have low chroma, but also a low value ranging from a dark brown to very dark grey. The deeper clay layer has a slightly higher value and is a dark greyish brown. Some faint redoximorphic features were observed in soil matrix collected from A-01, A-03, and A-04, but were not of sufficient concentration or in thick enough layers to meet hydric soil criteria. Prominent redoximorphic features in pore linings were present in a greater thickness within the soil profile collected from A-05 and in combination with the matrix color met the criteria for hydric soil F6, redox dark surface. This result is not surprising since sample location A-05 also contained 100 percent dominance of hydrophytic vegetation and possessed three hydrology indicators.

No hydrology indicators were present at sample points A-01 through A-04 or in the rest of the area covered by the visual assessment. The only hydrology indicators were found within the small wetland feature at sample point A-05. These included biotic crust (B12) in the form of remnant algal mats, oxidized rhizospheres along living roots (C3) observed in the soil sample, and a pass of the FAC-neutral test (number of OBL, FACW species > number of FACU, UPL species).

It should be noted that this assessment was performed in the context of the Phase IV project and therefore included a study area that extends approximately 130 feet away from the edge of development. There are other areas in Big Meadow, especially towards the southwest, that have much more developed wetland hydrology (i.e. surface water and saturation) and have abundant hydrophytic plant species. These features were not evaluated as part of this study because they are distant from Phase IV, but would need to be considered if any activities in the southern part of Big Meadow are planned.



Photo 1: Sample point A-02



Photo 2: Sample point A-04



Photo 3: Remnant algal mat near sample point A-05



Photo 4: Soil from sample pit at A-05. Note small reddish brown redox features

Table 2 - Sampling Results

Sample ID	Date	Northing	Easting	Vegetation Result		Soil Result	Hydrology Result	Is the Sampled Area Within a Wetland?	Is the Sample Within or Immediately Adjacent to the Impact Area/Buffer?
				Dominance Test	Prevalence Index				
A-01	4/3/18	2161475.83	6032127.70	50% (fail)	3.53 (fail)*	not hydric	no indicators present	no	yes
A-02	4/3/18	2161452.37	6032140.98	25% (fail)	--	not hydric	no indicators present	no	yes
A-03	4/3/18	2161517.47	6032043.66	0% (fail)	--	not hydric	no indicators present	no	yes
A-04	4/3/18	2161739.78	6031994.50	0% (fail)	--	not hydric	no indicators present	no	yes
A-05	4/3/18	2161691.72	6031902.30	100% (pass)	--	hydric - redox dark surface (F6)	yes - biotic crust (B12), oxidized rhizospheres along living roots (C3), FAC-neutral test (D5)	yes (wetland area 1,463 sf)	no

Note:

See Appendix A, Data Forms, for details

* Prevalence index performed as a check. No hydric soils or wetland hydrology present.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on this assessment, there are no potentially jurisdictional wetlands or waters of the U.S. present within the Phase IV development area or the 25-foot buffer. There are potentially jurisdictional wetlands present beyond the Phase IV development area and the 25-foot buffer. If in the future, new work is planned that could potentially extend into these other areas, a wetland delineation would need to be completed and submitted to USACE for verification. It should be noted that only the USACE can make the final jurisdictional determination of any wetlands or other waters of the U.S.

Because there are no wetlands present within the project limits or the 25-foot buffer, the project as currently designed will not result in the discharge of dredged or fill material into wetlands or waters of the U.S. nor will any work within or modification to wetlands occur.

6.0 REFERENCES

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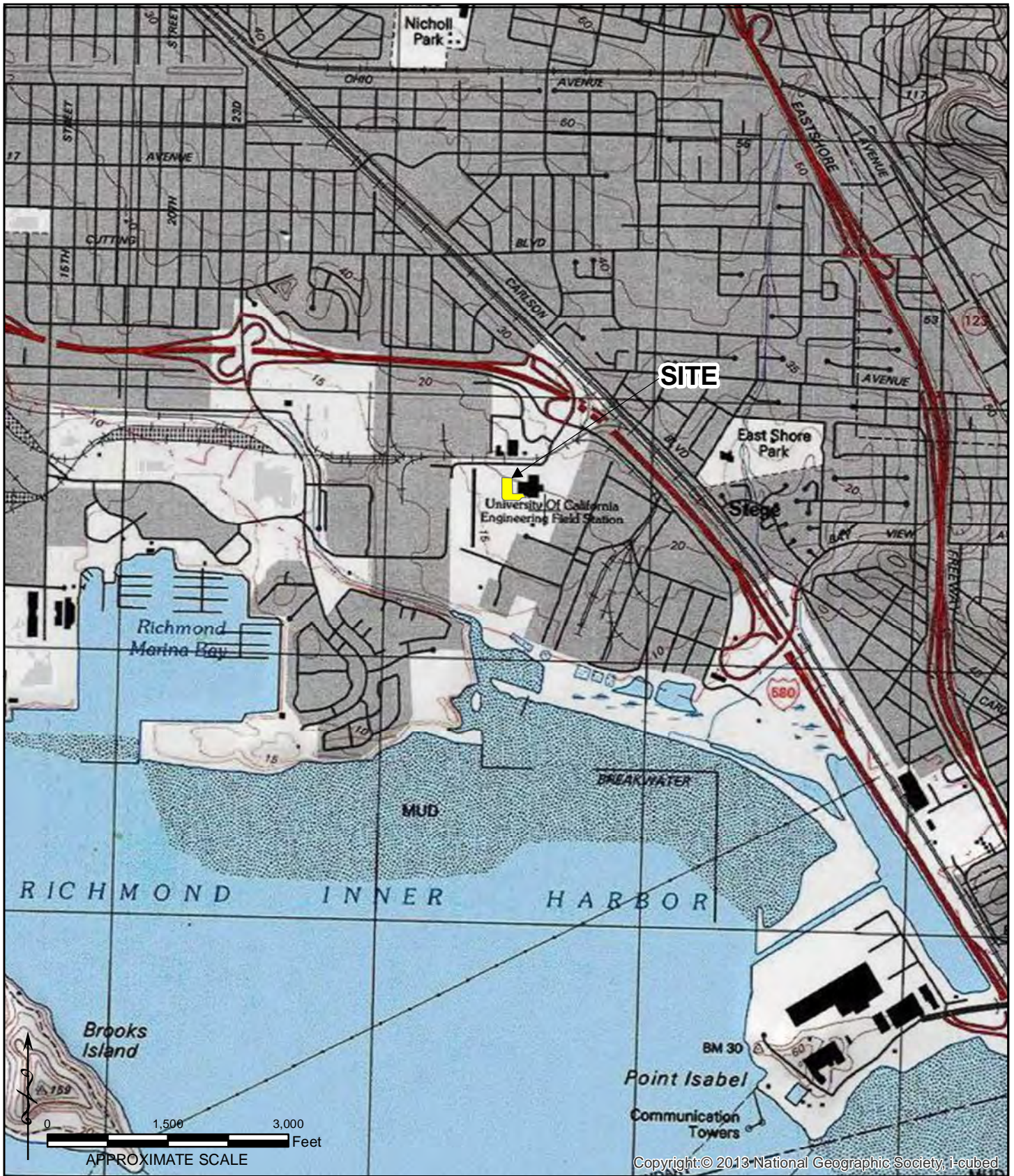
MAPS

MAP 1 VICINITY MAP

MAP 2 SITE PLAN AND SAMPLE LOCATIONS

MAP 3 SOILS

MAP 4 NATIONAL WETLANDS INVENTORY MAP



UC BERKELEY
 RICHMOND FIELD STATION
 NORTHERN REGIONAL
 LIBRARY FACILITY
 PHASE IV

APRIL 2018
 PREPARED BY: RANA CREEK
 HABITAT RESTORATION

MAP 1 VICINITY MAP



CONSULTANTS:

PROJECT TITLE:
UC BERKELEY
RICHMOND FIELD STATION
NORTHERN REGIONAL
LIBRARY FACILITY
PHASE IV

LOCATION:
RICHMOND
CONTRA COSTA COUNTY, CA

SHEET TITLE:
MAP 2
WETLANDS ASSESSMENT
**SITE PLAN &
SAMPLE LOCATIONS**

Imagery: April 2011
USGS

DATE: 2018.4.13

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Legend

- Sample Point
- Wetland (Approximate)
- Wetlands Study Area
- 25ft Construction Buffer
- Phase IV Development
- Property Boundaries

Notes

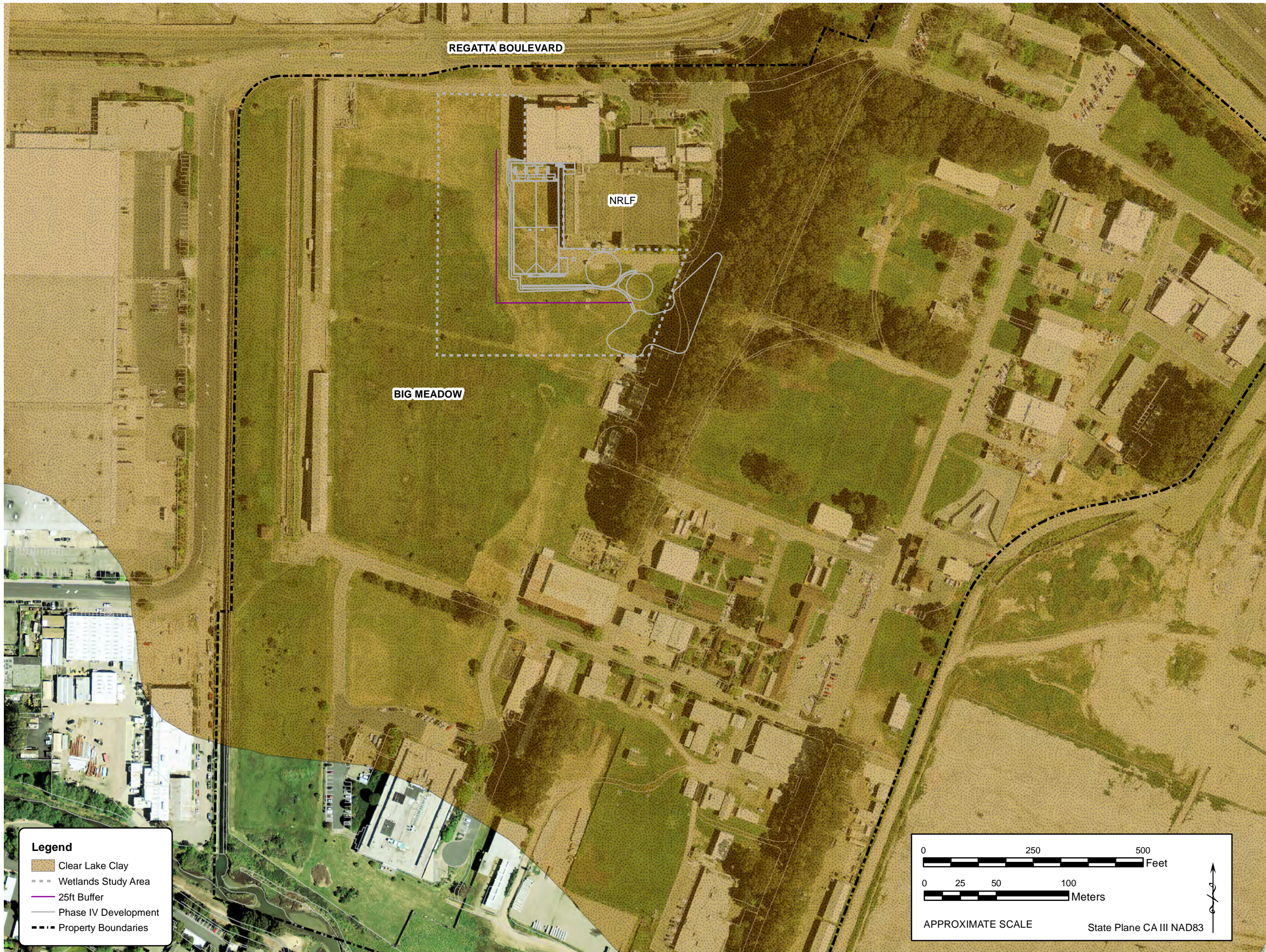
1. Vegetation, soils, and hydrology data/observations collected at each sample point, per Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).
2. This map was prepared as part of a Wetlands Reconnaissance in accordance with project mitigation measure BIO 6A.
3. Only wetlands within the Wetlands Study Area are shown

0 100 200
Feet

0 5 10 20 30 40
Meters

APPROXIMATE SCALE State Plane CA III NAD83

Document Path: L:\EnvPlan\3 ORDERS\UC Berkeley\RBC Coastal Prairie\GIS\layouts\Wetlands\UCB_Wetlands.mxd



Legend

- Clear Lake Clay
- Wetlands Study Area
- 25ft Buffer
- Phase IV Development
- Property Boundaries

0 250 500 Feet

0 25 50 100 Meters

APPROXIMATE SCALE State Plane CA III NAD83

CONSULTANTS:

PROJECT TITLE:
UC BERKELEY
RICHMOND FIELD STATION
NORTHERN REGIONAL
LIBRARY FACILITY
PHASE IV

LOCATION:
RICHMOND
CONTRA COSTA COUNTY, CA

SHEET TITLE:

MAP 3
WETLANDS ASSESSMENT
SOILS MAP

Imagery: April 2011
USGS

DATE: 2018.4.13

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CONSULTANTS:

PROJECT TITLE:
UC BERKELEY
RICHMOND FIELD STATION
NORTHERN REGIONAL
LIBRARY FACILITY
PHASE IV

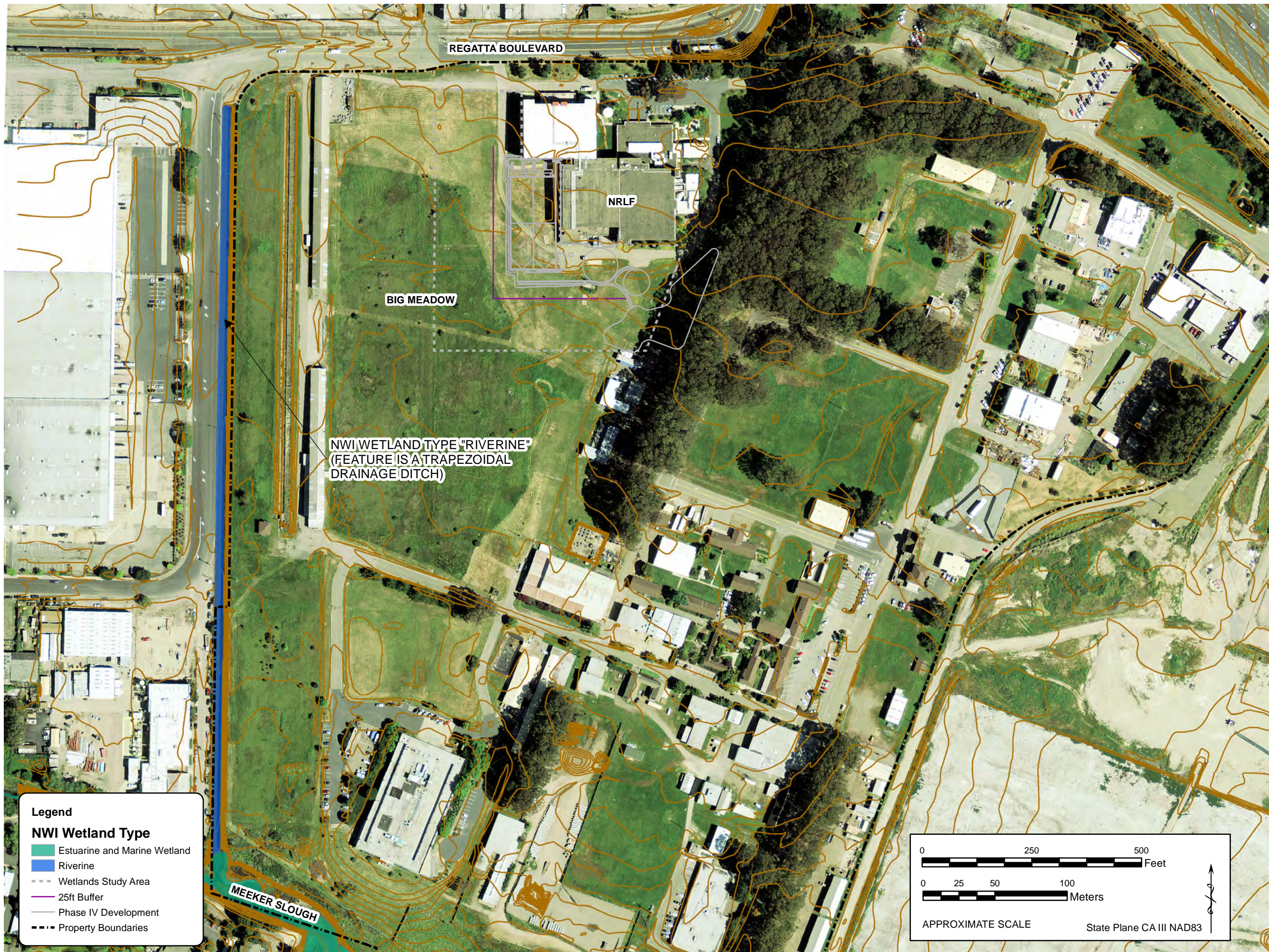
LOCATION:
RICHMOND
CONTRA COSTA COUNTY, CA

SHEET TITLE:
MAP 4
WETLANDS ASSESSMENT
**NATIONAL WETLANDS
INVENTORY MAP**

Imagery: April 2011
USGS

DATE: 2018.4.13

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REGATTA BOULEVARD

NRLF







BIG MEADOW

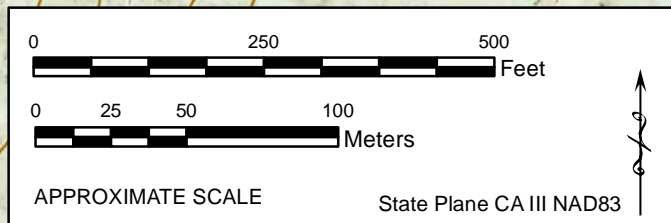
NW1 WETLAND TYPE "RIVERINE"
(FEATURE IS A TRAPEZOIDAL
DRAINAGE DITCH)

MEEKER SLOUGH

Legend

NWI Wetland Type

-  Estuarine and Marine Wetland
-  Riverine
-  Wetlands Study Area
-  25ft Buffer
-  Phase IV Development
-  Property Boundaries



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ATTACHMENT A

DATA FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: NRLF / U.C. Berkeley, RFS City/County: Richmond / Contra Costa Sampling Date: 4/3/18
 Applicant/Owner: U.C. Berkeley State: CA Sampling Point: A-01
 Investigator(s): John Wandke (Rana Creek Habitat Restoration) Section, Township, Range: Section 19, T1N, R4W
 Landform (hillslope, terrace, etc.): Coastal terrace Local relief (concave, convex, none): none, undulating Slope (%): <2%
 Subregion (LRR): Mediterranean California (LRR C) Lat: 37.916765014 N Long: 122.335841878 W Datum: WGS84
 Soil Map Unit Name: Clear Lake Clay, 0 to 15 percent slopes NWI classification: None (No Data)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

<p><u>Tree Stratum</u> (Plot size: _____)</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:60%;"></th> <th style="width:10%;">Absolute % Cover</th> <th style="width:10%;">Dominant Species?</th> <th style="width:10%;">Indicator Status</th> </tr> </thead> <tbody> <tr><td>1. _____</td><td></td><td></td><td></td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td colspan="4" style="text-align: right;">_____ = Total Cover</td></tr> </tbody> </table> <p><u>Sapling/Shrub Stratum</u> (Plot size: _____)</p> <table style="width:100%; border-collapse: collapse;"> <tbody> <tr><td>1. _____</td><td></td><td></td><td></td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td colspan="4" style="text-align: right;">_____ = Total Cover</td></tr> </tbody> </table> <p><u>Herb Stratum</u> (Plot size: <u>5 m radius</u>)</p> <table style="width:100%; border-collapse: collapse;"> <tbody> <tr><td>1. <u>Danthonia californica</u></td><td align="center"><u>36.3</u></td><td align="center"><u>yes</u></td><td align="center"><u>FAC</u></td></tr> <tr><td>2. <u>Festuca myuros</u></td><td align="center"><u>20.0</u></td><td align="center"><u>yes</u></td><td align="center"><u>FACU</u></td></tr> <tr><td>3. <u>Bromus hordaceus</u></td><td align="center"><u>8.8</u></td><td></td><td align="center"><u>FACU</u></td></tr> <tr><td>4. <u>Medicago polymorpha</u></td><td align="center"><u>7.5</u></td><td></td><td align="center"><u>FACU</u></td></tr> <tr><td>5. <u>Helminthoteca echioides</u></td><td align="center"><u>6.3</u></td><td></td><td align="center"><u>FAC</u></td></tr> <tr><td>6. <u>Plantago lanceolata</u></td><td align="center"><u>5.0</u></td><td></td><td align="center"><u>FAC</u></td></tr> <tr><td>7. <u>Geranium dissectum</u></td><td align="center"><u>3.5</u></td><td></td><td align="center"><u>UPL</u></td></tr> <tr><td>8. <u>Aira caryophylla</u></td><td align="center"><u>2.5</u></td><td></td><td align="center"><u>FACU</u></td></tr> <tr><td colspan="4" style="text-align: right;"><u>96.2*</u> = Total Cover</td></tr> </tbody> </table> <p><u>Woody Vine Stratum</u> (Plot size: _____) (*see attached sampling form)</p> <table style="width:100%; border-collapse: collapse;"> <tbody> <tr><td>1. _____</td><td></td><td></td><td></td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td colspan="4" style="text-align: right;">_____ = Total Cover</td></tr> </tbody> </table> <p>% Bare Ground in Herb Stratum <u>5</u> % Cover of Biotic Crust _____</p>		Absolute % Cover	Dominant Species?	Indicator Status	1. _____				2. _____				3. _____				4. _____				_____ = Total Cover				1. _____				2. _____				3. _____				4. _____				5. _____				_____ = Total Cover				1. <u>Danthonia californica</u>	<u>36.3</u>	<u>yes</u>	<u>FAC</u>	2. <u>Festuca myuros</u>	<u>20.0</u>	<u>yes</u>	<u>FACU</u>	3. <u>Bromus hordaceus</u>	<u>8.8</u>		<u>FACU</u>	4. <u>Medicago polymorpha</u>	<u>7.5</u>		<u>FACU</u>	5. <u>Helminthoteca echioides</u>	<u>6.3</u>		<u>FAC</u>	6. <u>Plantago lanceolata</u>	<u>5.0</u>		<u>FAC</u>	7. <u>Geranium dissectum</u>	<u>3.5</u>		<u>UPL</u>	8. <u>Aira caryophylla</u>	<u>2.5</u>		<u>FACU</u>	<u>96.2*</u> = Total Cover				1. _____				2. _____				_____ = Total Cover				<p>Dominance Test worksheet:</p> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
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SOIL

Sampling Point: A-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	7.5 YR 2/1	100					clay loam	
10-13	7.5 YR 3/1	98	7.5 YR 6/4	2	C	M	clay loam	
13-20	10 YR 4/2	100					clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5) **(LRR C)**
- 1 cm Muck (A9) **(LRR D)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Vernal Pools (F9)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) **(LRR C)**
- 2 cm Muck (A10) **(LRR B)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: clay
 Depth (inches): 13

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Biotic Crust (B12)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: NRLF / U.C. Berkeley, RFS City/County: Richmond / Contra Costa Sampling Date: 4/3/18
 Applicant/Owner: U.C. Berkeley State: CA Sampling Point: A-02
 Investigator(s): John Wandke (Rana Creek Habitat Restoration) Section, Township, Range: Section 19, T1N, R4W
 Landform (hillslope, terrace, etc.): Coastal terrace Local relief (concave, convex, none): none, undulating Slope (%): <2%
 Subregion (LRR): Mediterranean California (LRR C) Lat: 37.916701288 N Long: 122.335794247 W Datum: WGS84
 Soil Map Unit Name: Clear Lake Clay, 0 to 15 percent slopes NWI classification: None (No Data)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5 m radius</u>)				
1. <u>Festuca myuros</u>	<u>16.3</u>	<u>yes</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Danthonia californica</u>	<u>12.5</u>	<u>yes</u>	<u>FAC</u>	
3. <u>Taraxia ovata</u>	<u>11.3</u>	<u>yes</u>	<u>UPL</u>	
4. <u>Ranunculus californica</u>	<u>10.0</u>	<u>yes</u>	<u>FACU</u>	
5. <u>Aira caryophyllea</u>	<u>8.8</u>		<u>FACU</u>	
6. <u>Hypochaeris radicata</u>	<u>6.3</u>		<u>FACU</u>	
7. <u>Grindelia hirsutula</u>	<u>6.3</u>		<u>FACW</u>	
8. <u>Heminthotheca echioides</u>	<u>3.8</u>		<u>FAC</u>	
<u>85.2*</u> = Total Cover				
Woody Vine Stratum (Plot size: _____) (*see attached sampling form)				
1. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>5</u>		% Cover of Biotic Crust _____		Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:				

SOIL

Sampling Point: A-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	7.5 YR 3/1	100					clay loam	
10-20	10 YR 4/2	100					clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: <u>clay</u> Depth (inches): <u>10</u>	Hydric Soil Present? Yes _____ No <u>X</u>
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Remarks:

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Water Marks (B1) (Riverine)
	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
	<input type="checkbox"/> Drainage Patterns (B10)
	<input type="checkbox"/> Dry-Season Water Table (C2)
	<input type="checkbox"/> Crayfish Burrows (C8)
	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
	<input type="checkbox"/> Shallow Aquitard (D3)
	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: NRLF / U.C. Berkeley, RFS City/County: Richmond / Contra Costa Sampling Date: 4/3/18
 Applicant/Owner: U.C. Berkeley State: CA Sampling Point: A-03
 Investigator(s): John Wandke (Rana Creek Habitat Restoration) Section, Township, Range: Section 19, T1N, R4W
 Landform (hillslope, terrace, etc.): Coastal terrace Local relief (concave, convex, none): none, undulating Slope (%): <2%
 Subregion (LRR): Mediterranean California (LRR C) Lat: 37.916874807 N Long: 122.336135960 W Datum: WGS84
 Soil Map Unit Name: Clear Lake Clay, 0 to 15 percent slopes NWI classification: None (No Data)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Herb Stratum (Plot size: <u>5 m radius</u>)				
1. <u>Festuca myuros</u>	<u>41.3</u>	<u>yes</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Phalaris aquatica</u>	<u>30.0</u>	<u>yes</u>	<u>FACU</u>	
3. <u>Helminthotheca echioides</u>	<u>13.8</u>		<u>FAC</u>	
4. <u>Geranium dissectum</u>	<u>6.8</u>		<u>UPL</u>	
5. <u>Avena barbata</u>	<u>2.5</u>		<u>UPL</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>94.4</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
% Bare Ground in Herb Stratum <u>6</u> % Cover of Biotic Crust _____				
Remarks:				

SOIL

Sampling Point: A-03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	7.5 YR 3/1	100						
2-4	2.5 Y 5/3	20					clay	
2-4	7.5 YR 3/1	80					clay loam	
4-8	7.5 YR 3/1	100					clay loam	angular gravel to 0.25"
8-17	7.5 YR 3/1	100					clay loam	
17-20	7.5 YR 3/1	99	5 YR 4/4	1	C	M	clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5) (LRR C)
- 1 cm Muck (A9) (LRR D)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Vernal Pools (F9)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) (LRR C)
- 2 cm Muck (A10) (LRR B)
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1) (Nonriverine)
- Sediment Deposits (B2) (Nonriverine)
- Drift Deposits (B3) (Nonriverine)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Water-Stained Leaves (B9)

- Salt Crust (B11)
- Biotic Crust (B12)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water Marks (B1) (Riverine)
- Sediment Deposits (B2) (Riverine)
- Drift Deposits (B3) (Riverine)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water Table Present? Yes _____ No X Depth (inches): _____
 Saturation Present? Yes _____ No X Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: NRLF / U.C. Berkeley, RFS City/County: Richmond / Contra Costa Sampling Date: 4/3/18
 Applicant/Owner: U.C. Berkeley State: CA Sampling Point: A-04
 Investigator(s): John Wandke (Rana Creek Habitat Restoration) Section, Township, Range: Section 19, T1N, R4W
 Landform (hillslope, terrace, etc.): Coastal terrace Local relief (concave, convex, none): flat, undulating Slope (%): <2%
 Subregion (LRR): Mediterranean California (LRR C) Lat: 37.917482557 N Long: 122.336321475 W Datum: WGS84
 Soil Map Unit Name: Clear Lake Clay, 0 to 15 percent slopes NWI classification: None (No Data)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
3. _____				
4. _____				
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
Herb Stratum (Plot size: <u>5 m radius</u>)				
1. <u>Medicago polymorpha</u>	33.8	yes	FACU	
2. <u>Festuca myuros</u>	22.5	yes	FACU	
3. <u>Bromus hordeaceus</u>	10.0		FACU	
4. <u>Phalaris aquatica</u>	10.0		FACU	
5. <u>Geranium dissectum</u>	8.5		UPL	
6. <u>Helminthotheca echioides</u>	4.3		FAC	
7. <u>Trifolium repens</u>	3.8		FACU	
8. <u>Vicia villosa</u>	1.8		UPL	
96.5* = Total Cover				
(*see attached sampling form)				
Woody Vine Stratum (Plot size: _____)				
1. _____				
2. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>5</u>		% Cover of Biotic Crust _____		
Remarks:				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

Hydrophytic Vegetation Present? Yes No

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

SOIL

Sampling Point: A-04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	7.5 YR 3/1	100					clay loam	
5-11	7.5 YR 3/1	99	5 YR 4/4	1	C	M	clay loam	
12-20	7.5 YR 3/1	100					clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5) **(LRR C)**
- 1 cm Muck (A9) **(LRR D)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Vernal Pools (F9)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) **(LRR C)**
- 2 cm Muck (A10) **(LRR B)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Biotic Crust (B12)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water Table Present? Yes _____ No X Depth (inches): _____
 Saturation Present? Yes _____ No X Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: NRLF / U.C. Berkeley, RFS City/County: Richmond / Contra Costa Sampling Date: 4/3/18
 Applicant/Owner: U.C. Berkeley State: CA Sampling Point: A-05
 Investigator(s): John Wandke (Rana Creek Habitat Restoration) Section, Township, Range: Section 19, T1N, R4W
 Landform (hillslope, terrace, etc.): Coastal terrace Local relief (concave, convex, none): none, undulating Slope (%): <2%
 Subregion (LRR): Mediterranean California (LRR C) Lat: 37.917345621 N Long: 122.336637759 W Datum: WGS84
 Soil Map Unit Name: Clear Lake Clay, 0 to 15 percent slopes NWI classification: None (No Data)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5 m radius</u>)				
1. <u>Hordeum brachyantherum</u>	<u>70.0</u>	<u>yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Juncus phaeocephalus</u>	<u>5.0</u>		<u>FACW</u>	
3. <u>Rumex salicifolia</u>	<u>3.8</u>		<u>FACW</u>	
4. <u>Rumex crispus</u>	<u>2.5</u>		<u>FAC</u>	
5. <u>Geranium dissectum</u>	<u>2.0</u>		<u>UPL</u>	
6. <u>Helminthotheca echioides</u>	<u>1.3</u>		<u>FAC</u>	
7. <u>Vicia villosa</u>	<u>0.5</u>		<u>UPL</u>	
8. <u>Festuca perennis</u>	<u>0.5</u>		<u>FAC</u>	
<u>85.6</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>15</u> % Cover of Biotic Crust <u>10</u>				
Remarks:				
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

SOIL

Sampling Point: A-05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
2-5	10 YR 3/1	98	5 YR 4/4	2	C	PL	clay loam	
5-16	10 YR 3/1	99	5 YR 4/4	1	C	PL	clay loam	
16-20	2.5 Y 3/1	100					clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR C) <input type="checkbox"/> 1 cm Muck (A9) (LRR D) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Vernal Pools (F9)

Restrictive Layer (if present):	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: <u>clay</u> Depth (inches): <u>16</u>	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) (Nonriverine) <input type="checkbox"/> Sediment Deposits (B2) (Nonriverine) <input type="checkbox"/> Drift Deposits (B3) (Nonriverine) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input checked="" type="checkbox"/> Biotic Crust (B12) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Water Marks (B1) (Riverine) <input type="checkbox"/> Sediment Deposits (B2) (Riverine) <input type="checkbox"/> Drift Deposits (B3) (Riverine) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
"Biotic Crust" is remnant free floating algal mat.

Vegetation Sampling Data Form
 0.25 meter quadrat
 5 meter radius plot size for herbaceous layer

Project Site: NRLF / U.C. Berkeley, RFS
 Date: 4/3/18
 Plot #: A-01

Species	Indicator Status	Quadrat Percent Cover				MEAN
		Q1	Q2	Q3	Q4	
1 Helminthoteca echiodes	FAC	10	5	0	10	6.3
2 Plantago lanceolata	FAC	15	5	0	0	5.0
3 Aira caryophyllea	FACU	10	0	0	0	2.5
4 Festuca (Vulpia) myuros	FACU	10	20	20	30	20.0
5 Danthonia californica	FAC	25	50	30	40	36.3
6 Geranium dissectum	UPL	5	2	2	5	3.5
7 Bromus diandrus	UPL	5	0	0	0	1.3
8 Bromus hordaceous	FACU	5	0	20	10	8.8
9 Medicago polymorpha	FACU	5	20	0	5	7.5
10 Lotus corniculatus	FAC	0	0	10	0	2.5
11 Vicia villosa	UPL	0	0	5	5	2.5
12						
13						
14						
15						
16						
Total mean cover						96.2
50% mean cover						48.1

Vegetation Sampling Data Form
 0.25 meter quadrat
 5 meter radius plot size for herbaceous layer

Project Site: NRLF / U.C. Berkeley, RFS
 Date: 4/3/18
 Plot #: A-02

Species	Indicator Status	Quadrat Percent Cover				MEAN
		Q1	Q2	Q3	Q4	
4 Festuca (Vulpia) myuros	FACU	10	5	20	30	16.3
2 Danthonia californica	FAC	30	10	0	10	12.5
7 Taraxia ovata	UPL	15	5	5	20	11.3
3 Ranunculus californica	FACU	10	15	0	15	10.0
5 Aira caryophyllea	FACU	5	10	20	0	8.8
1 Hypochaeris radicata	FACU	15	0	0	10	6.3
8 Grindelia hirsutula	FACW	10	0	15	0	6.3
6 Helminthoteca echioides	FAC	5	10	0	0	3.8
14 Lysimachia arvensis	FAC	0	10	5	0	3.8
10 Plantago lanceolata	FAC	0	2	5	0	1.8
11 Geranium dissectum	UPL	0	2	2	2	1.5
13 Erodium botrys	FACU	0	1	3	0	1.0
15 Sisyrinchium bellum	FACW	0	0	3	1	1.0
12 Hypochaeris glabra	UPL	0	2	0	0	0.5
9 Vicia villosa	UPL	1	0	0	0	0.3
16						
Total mean cover						85.2
50% mean cover						42.6

Vegetation Sampling Data Form
 0.25 meter quadrat
 5 meter radius plot size for herbaceous layer

Project Site: NRLF / U.C. Berkeley, RFS
 Date: 4/3/18
 Plot #: A-03

Species	Indicator Status	Quadrat Percent Cover				MEAN
		Q1	Q2	Q3	Q4	
2 Festuca (Vulpia) myuros	FACU	80	30	5	50	41.3
3 Phalaris aquatica	FACU	10	20	90	0	30.0
4 Helminthoteca echioides	FAC	0	15	0	40	13.8
1 Geranium dissectum	UPL	10	10	2	5	6.8
5 Avena barbata	UPL	0	10	0	0	2.5
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
Total mean cover						94.4
50% mean cover						47.2

Vegetation Sampling Data Form
 0.25 meter quadrat
 5 meter radius plot size for herbaceous layer

Project Site: NRLF / U.C. Berkeley, RFS
 Date: 4/3/18
 Plot #: A-04

Species	Indicator Status	Quadrat Percent Cover				MEAN
		Q1	Q2	Q3	Q4	
1 Medicago polymorpha	FACU	40	5	10	80	33.8
2 Festuca (Vulpia) myuros	FACU	30	10	30	20	22.5
6 Bromus hordaceus	FACU	10	10	10	10	10.0
9 Phalaris aquatica	FACU	0	40	0	0	10.0
3 Geranium dissectum	UPL	2	10	20	2	8.5
5 Helminthoteca echioides	FAC	5	0	10	2	4.3
8 Trifolium repens	FACU	0	15	0	0	3.8
7 Vicia villosa	UPL	5	0	2	0	1.8
4 Lepidium latifolium	FAC	0	5	0	0	1.3
10 Avena barbata	UPL	0	0	2	0	0.5
11						
12						
13						
14						
15						
16						
Total mean cover						96.5
50% mean cover						48.3

Vegetation Sampling Data Form

0.25 meter quadrat

5 meter radius plot size for herbaceous layer

Project Site: NRLF / U.C. Berkeley, RFS

Date: 4/3/18

Plot #: **A-05**

Species		Indicator Status	Quadrat Percent Cover				MEAN
			Q1	Q2	Q3	Q4	
1	Hordeum brachyantherum	FACW	80	70	70	60	70.0
4	Juncus phaeocephalus	FACW	0	20	0	0	5.0
6	Rumex salicifolius	FACW	0	0	15	0	3.8
5	Rumex crispus	FAC	0	10	0	0	2.5
2	Geranium dissectum	UPL	5	0	2	1	2.0
3	Helminthotheca echioides	FAC	2	0	1	2	1.3
7	Vicia villosa	UPL	0	0	2	0	0.5
8	Festuca perennis	FAC	0	0	2	0	0.5
9							
10							
11							
12							
13							
14							
15							
16							
Total mean cover							85.6
50% mean cover							42.8